RESEARCH ARTICLE

Ecological and Ethnobotanical Characterisation of Gujarat Forests

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Abstract

This study focused on the ecological and ethnobotanical characteristics of the natural forests, forest plantations, and forest orchards in the Gujarat state of India through an extensive field survey of trees, shrubs, and herbs over a span of four years. We inventoried 345 tree, 345 shrub, and 1,380 herb plots using a stratified random sampling design. In all, 706 species [trees (224), shrubs (68), and herbs (414)] were recorded. The highest number of species were noted in teak mixed dry deciduous forest (207), followed by scrub (132), thorn forest (91), grassland (78), teak mixed moist deciduous forest (51), forest plantations (34), degraded forest (30), *Prosopis juliflora* scrub (24), forest orchard (19), ravine thorn forest (16), *Anogeissus pendula* forest (8), riverain forest (8), Eucalyptus plantation (6), mangrove forest (1), and mangrove scrub (1). Fabaceae was observed to be the dominant family. Out of total species, twenty-nine (29) species were found to be rare (25), endangered (2), and threatened (2). Fabaceae was also the dominant family for rare, endangered, and threatened (RET) species. Six endemic species were recorded. The highest value of Shannon's Index of plant diversity was noticed in teak mixed dry deciduous forest (3.14), followed by teak mixed moist deciduous forest (2.96), ravine thorn forest (2.08), forest plantations (1.97), thorn forest (1.64), riverine forest (1.41), and degraded forest (1.49). Two hundred fifty-two species, including trees (24), shrubs (101), herbs (123), climbers (3), and bamboo (1) found to be ethnobotanically important. Fabaceae happened to be the dominant family in terms of ethnobotanically important plants too.

Keywords: Ethnobotanical species, RET species, Satellite imagery, Shannon's index, Stratified random sampling.

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Introduction

Biodiversity provides stability to the ecosystem and maintains the ecological balance. Plants and animals in the ecosystem are linked to each other through the food chain and food web (NRC, 1992). The diversity of plant and animal life is an essential underpinning of the terrestrial ecosystems (Singh and Kushwaha, 2008). Worldwide, tens of thousands of species of higher plants and several hundred lower plants are used by humans for food, fuel, fiber, oil, medicine, spices, dye, fodder, timber, and other uses (Belal and Springuel, 1996). In tropics, 25,000 plant species have been widely used in traditional medicines (Heywood, 1996), whose sources are natural forests. Provisioning of ecosystem services is another vital role of plants through stabilization of slopes, improvement of soils, moderation of climate, and the provision of a habitat for much of wild fauna (Krupnick, 2001). It is now generally accepted that conservation of biodiversity should be humans' top priority, especially through the management and sustainable use of natural habitats and resources. This is an important idea that can be achieved and there are convincing scientific, economic, and sociological reasons (Hamilton, 2003). The study of the distribution of species, which has long been a central focus on ecology and biogeography, is taking on new urgency as evidence of the global biodiversity crisis mounts.

The Indian subcontinent holds prominence as one of the twelve mega-diversity regions of the world (Arora and Nayar, 1984). It is floristically rich, with about 33 % of its botanical wealth (overall 15,000 species of higher plants) being endemic. There are about 141 endemic genera distributed over 47 families (Nayar, 1980). Furthermore, of the 4,900 endemic species, a large percentage is localized in the Himalaya (about 2,532 species) than in other regions like peninsular India (1,788 species) and Andaman and Nicobar Islands (185 species). It is also estimated that floristic richness is highest in the north-eastern region, which holds about 50 % of India's total species diversity, *i.e.,* more than 7,000 species and is considered as the cradle of flowering plants (Nayar, 1989).

The use of herbs in ayurvedic preparations of the Indian system of traditional medicines has been an alternative system of medicine for thousands of years (Chopra, 2003). The earliest literature on Indian medicinal practice appeared during the Vedic period in India, *viz.*, mid-second millennium BC. The *Susruta Samhita* and the *Charak Samhita* were among the foundational works of Ayurveda. Up to 80 percent people

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in India used some form of traditional medicines, a category which includes Ayurveda (Wujastyk, 2003). The unchecked degradation and deforestation of natural forest has significantly depleted ethnobotanically important species over time. In this context, a study was conducted in Gujarat to assess the ecological and ethnobotanical characteristics of the forests and forest plantations using field inventory techniques. It is expected that the information, so generated, would be helpful in the conservation and management of the forest ecosystems in the State.

Materials and Methods

Study area

The State of Gujarat in western India (20°07′-24°43′N and 68°10′-74°29′E) covers a geographical area of 196,244 km^2. To its north-west is the international boundary shared with Pakistan and to its western and south-western sides lies the Arabian Sea with two gulfs- the Gulf of Kachchh and Gulf of Khambhat (Fig. 1). Gujarat has a 1650 km long coastline, which is longest for any state in the country. As per the 2011 census, the total population of Gujarat was 60.44 million, of which 25.74 million (42.60%) lives in urban and 34.70 million (57.40%) in rural areas. The average human population density in Gujarat is 308 persons per km^{-2}. The tribal population in the State is 8.92 million (14.75%). The temperature in the State varies from 6 to 45ºC and humidity is generally low (Ray *et al*., 2009). The State receives 250 to 2500 mm rainfall from the south-west monsoon (June to September).

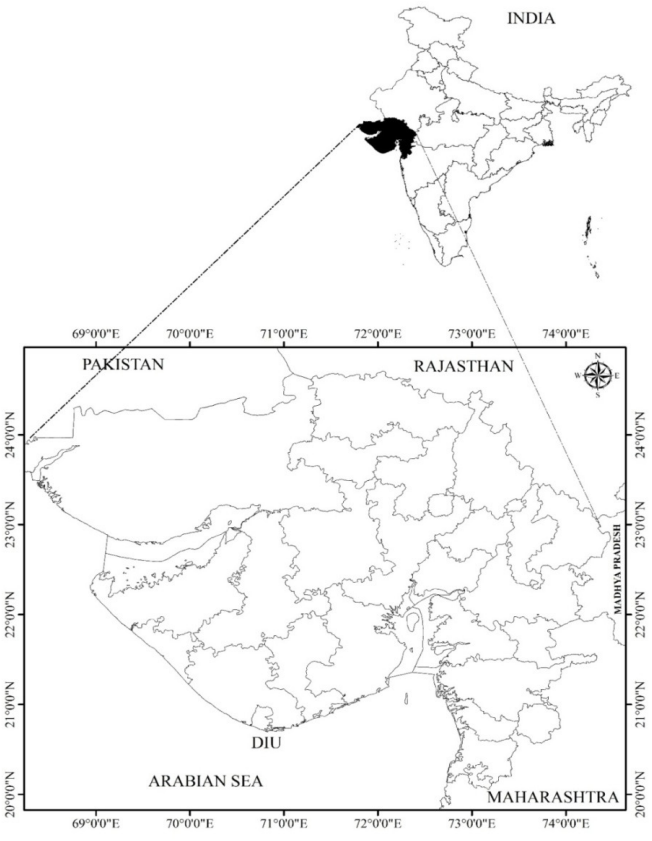

Fig. 1: The study area.

The Dangs region in south Gujarat receives as high as 2500 mm while Kachchh district in north receives only 250 mm rainfall, though changing pattern of rainfall has been observed during the past decade (Dave *et al*., 2017).

Gujarat has a range of natural habitats like dry saline Rann of Kachchh, grasslands, rivers, wetlands, reservoirs, and coastal areas, with dry and moist deciduous forests, thorn forests, grasslands, mangroves, and coral reefs though most of the forests are now restricted to hilly tracts. Diverse physiographic, climatic, and ecological conditions in the State are responsible for the high diversity of flora and fauna (GEC, 1996). As per the India State of Forest Report 2019 (FSI, 2019), forests in Gujarat occupy an area of 14,857 km^2 (7.57% of the geog. area). Gujarat has 26 forest types belonging to 4 major type groups, *viz*., *Tropical Dry Deciduous, Tropical Moist Deciduous, Tropical Thorn*, and *Littoral and Swamp Forests*. The major type groups are further classified into *Dry Teak Forest, Moist Teak Bearing Forests, Northern Tropical Thorn Forest, Mangrove Forest, Mangrove Scrub, Dry Tropical Riverine Forest, Ravine Thorn Forest, Anogeissus pendula Forest*, and *Dry Grassland* (Champion and Seth, 1968).

Methodology

Ecosystem level biodiversity assessment requires robust phytosociological data collected using appropriate field sampling techniques (Kushwaha and Nandy, 2012). The fieldwork consisted of a pilot survey, sample plot inventory of trees, shrubs, and herbs and collection and documentation of the species of ethnobotanical importance. The study was conducted from September 2008 to May 2012. A total of 345 tree plots of 31.62m x 31.62m size were laid for a sampling of trees, shrubs, and herbs. Each tree plot had 1 shrub plot of 5m x 5m size at the center and 4 herb plots of 1m x 1m size in four corners as nested plots. Thus, 354 sample plots for trees, 345 plots for shrubs, and 1380 plots for herbs were inventoried. Plot sizes were decided on the basis of the pilot survey. The forest type strata sizes, mapped by digital interpretation of the satellite imagery in a nationwide biodiversity characterization project (Bhatt *et al*., 2015), were used for the determination of the number of plots to be inventoried following stratified random sampling (SRS) design. The coordinates of the sampled plots were recorded using hand-held GPS for future monitoring.

In each tree plot, the number of shrubs, herbs, epiphytes, and climbers were recorded. The field data were subjected to Shannon's Index of diversity (Shannon, 1949) and ethnobotanical analyses. Local tribals (*Bhils, Gamits, Gonds, Konknas, Kotwalias, Rabaris, Varlis,* and *Rathod*), with comprehensive knowledge in the use of different species for medicinal purposes, were involved in the field survey. Additional ethnobotanical information was collected through questionnaires, village-level interviews, and interactions with herbal medicine practitioners. The RET species list was prepared following IUCN (1994), Vié *et al*. (2008), and BSI (2013). Plant species were identified with the help of experts from the Department of Botany, MS University of Baroda, Vadodara and local floras (Borgesen, 1929; Santapau, 1955, 1962; Ahluwalia, 1964-1965; Bedi, 1970; Bhatt, 1971; Shah, 1978; Ambasht, 1986; Bhatt and Sabins, 1987; Joshi, 1987; Jadeja, 1999; Jasrai *et al*., 2004; Pandey *et al*., 2005).

Results and Discussion

In all, 706 species including trees (224), shrubs (68), and herbs (414) were found in the forests, forest plantations, and forest orchards of Gujarat. The highest number of species were noted in teak mixed dry deciduous forest (207), followed by scrub (132), thorn forest (91), grassland (78), teak mixed moist deciduous forest (51), forest plantations (34), degraded forest (30), *Prosopis juliflora* scrub (24), forest orchard (19), ravine thorn forest (16), *Anogeissus pendula* forest (8), riverain forest (8), Eucalyptus plantation (6), mangrove forest (1), and mangrove scrub (1) (Table 1).

The total number of tree species found was 224 in different forest areas of Gujarat; of which 73.21 % were from teak mixed dry deciduous, teak mixed moist deciduous, forest plantations, and thorn forest. Total number shrub species found were 68, of which 77.94 % were from the scrub, thorn forest, and tropical mixed dry deciduous forest. The total number of herb species found was 414, of which 79.23 % were from teak mixed dry deciduous forest, scrub, grassland, and thorn forest. Twenty nine (29) rare, endangered, and threatened (RET) species belonging to 20 herbs, 7 shrubs, and 2 trees were recorded (Table 2). The number of rare species was found to be nearly

Table 1: Number of species in different forest types.

Forest type	*No. of species*			*Total species*
	Trees	*Shrubs*	*Herbs*	
Tropical Mixed Dry Deciduous Forest	95	13	99	207
Tropical Mixed Moist Deciduous Forest	31	4	16	51
Thorn Forest	17	17	57	91
Ravine Thorn Forest	11	0	5	16
Mangrove Forest	1	0	0	1
Mangrove Scrub	0	1	0	1
Riverain Forest	8	0	0	8
Anogeissus pendula Forest	8	0	0	8
Degraded Forest	13	6	11	30
Forest Plantation	21	0	13	34
Eucalyptus Plantation	1	0	5	6
Prosopis juliflora Scrub	1	4	19	24
Scrub	15	23	94	132
Orchard	2	0	17	19
Grassland	0	0	78	78
Total	224	68	414	706

Table 2: RET species in different forest types.

S.No.	*Botanical name*	*Family*	*Status*	*Habit*	*Forest type*	*Gujarati name*
1.	*Anogeissus sericea* var. *nummularia*	Combretaceae	Rare	Tree	TH, RTH	Andrakh
2.	*Campylanthus ramosissimus*	Plantaginaceae	-do-	Shrub	TMMD, TMDD	Bhinighilodi
3.	*Canscora diffusa*	Gentianaceae	Threatened	Herb	TMMD, TMDD	Zinkukariyatu
4.	*Ceropegia odorata*	Apocynaceae	Endangered	-do-	TMMD, TMDD	Kundernivel
5.	*Chlorophytum bharuchae*	Asparagaceae	Rare	-do-	TMMD, TMDD	Safed musali
6.	*Chlorophytum borivilianum*	-do-	-do-	-do-	TMMD, TMDD	Musali
7.	*Convolvulus stocksii*	Convolvulaceae	-do-	-do-	P, GR, TMDD, TH	Uhishankhavali
8.	*Dendrobium microbulbon*	Orchidaceae	-do-	-do-	TMMD	Button orchid
9.	*Dipcadi ursulae* var. *longiracemosum*	Asparagaceae	Endangered	-do-	P, GR, TMDD, RTH	Jangalidungadi
10.	*Eriocauloneury peplon*	Eriocaulaceae	Threatened	-do-	RV	Nada chido
11.	*Eulophia dabia*	Orchidaceae	Rare	-do-	TMMD, GR	Nano vando
12.	*Fuirena tuwensis*	Cyperaceae	Rare/Endemic	-do-	RV	Kansado
13.	*Helichrysum cutchicum*	Asteraceae	-do-	-do-	GR	Safed munderi
14.	*Heliotropium bacciferum*	Boraginaceae	Rare	-do-	GR	Okharad
15.	*Hyphaene dichotoma*	Arecaceae	Vulnerable	Tree	SL,RV	Ravan tad
16.	*Indigofera coerulea* var. *monosperma*	Fabaceae	Rare	Herb	GR	Jangaligali
17.	*Ischaemum santapaui*	Poaceae	-do-	-do-	GR, RV	Valerughas
18.	*Limonium stocksii*	Plumbaginaceae	-do-	Shrub	SL	Dariyaichitrak
19.	*Pavonia ceratocarpa*	Malvaceae	-do-	-do-	GR, SC	Karandia
20.	*Psilostachys sericea*	Amaranthaceae	-do-	Herb	SL	Dariyaitandalajo
21.	*Pycreus dwarkensis*	Cyperaceae	Rare/Endemic	-do-	GR	Dariyaichido
22.	*Schweinfurthia papilionacea*	Plantaginaceae	Rare	-do-	GR	Sannipat
23.	*Sesbania concolor*	Fabaceae	-do-	Shrub	GR	Ikad
24.	*Solanum purpureilineatum*	Solanaceae	-do-	-do-	GR, BL	Ubhiringani
25.	*Tamarix kutchensis*	Tamaricaceae	-do-	-do-	SL	Lai nijat
26.	*Tamarix stricta*	-do-	-do-	-do-	SL	Lai
27.	*Tephrosia collina*	Fabaceae	Rare/Endemic	Herb	GR	Makhamalisarpankho
28.	*Tephrosia jamnagarensis*	-do-	-do-	-do-	GR	Zinkosarpankho
29.	*Viola cinerea*	Violaceae	Rare	-do-	SC	Banafasha

TMMD-Teak Mixed Moist Deciduous, TMDD-Teak Mixed Dry Deciduous, TH-Thorn, RTH-Ravine Thorn, M-Mangrove, MS-Mangrove Scrub, RV-Riverine, DEG-Degraded, P-*Prosopis julflora* Scrub, SC-Scrub, GR-Grassland, SL-Salt-affected land, BL-Barren land.

twelve times higher than either endangered or threatened species.

Fabaceae, with 41 species, was the dominant family, followed by Malvaceae (23), Asteraceae (18), Acanthaceae (15), and Lamiaceae (12) (Fig. 2). Predominant genera (by a number of species) in different forest types were *Euphorbia* (5), followed by *Acacia* (4), *Capparis* (4), *Corchorus* (4), *Ficus* (4), *Senna* (4), and *Sida* (4). Six endemic species were also recorded in the study area. Fabaceae and Asparagaceae together had the maximum number of endemic species. The highest Shannon's index of plant diversity was noted in teak mixed dry deciduous forest (3.14), followed by teak mixed moist deciduous forest (2.96), ravine thorn forest (2.08), forest plantation (1.97), thorn forest (1.64), riverine forest (1.41), and degraded forest (1.49) (Fig. 3). As many as 252 ethnobotanically important plant species, comprising of trees, shrubs, and herbs, were listed from forests of Gujarat (Table 3). It may be thus, concluded that the forests of Gujarat support a rich plant diversity with high ecological and ethnobotanical potential.

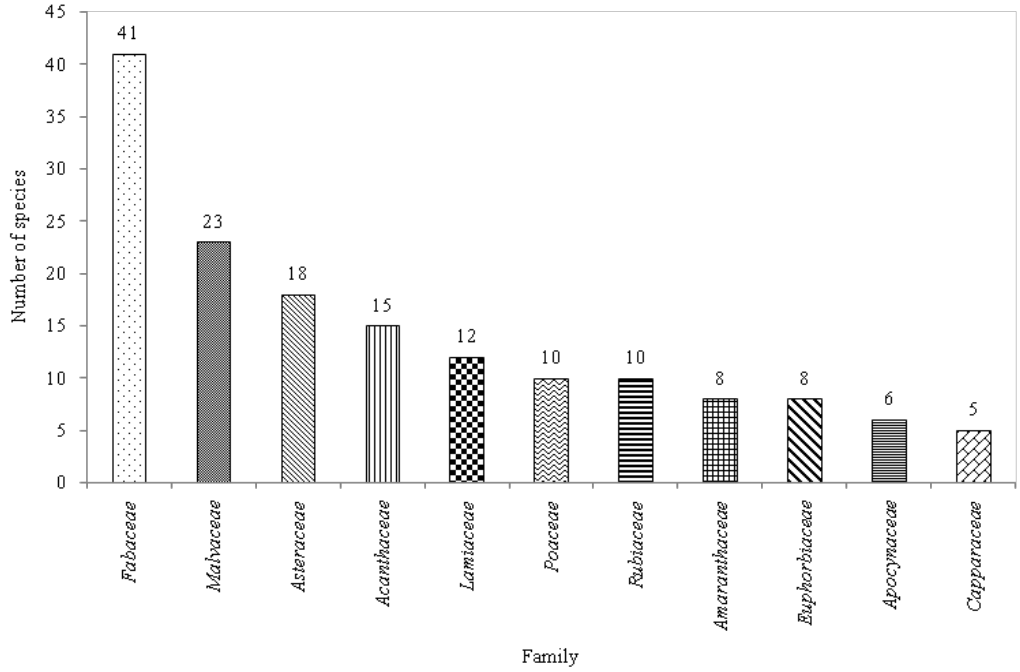

Fig. 2: Number of species in top eleven families.

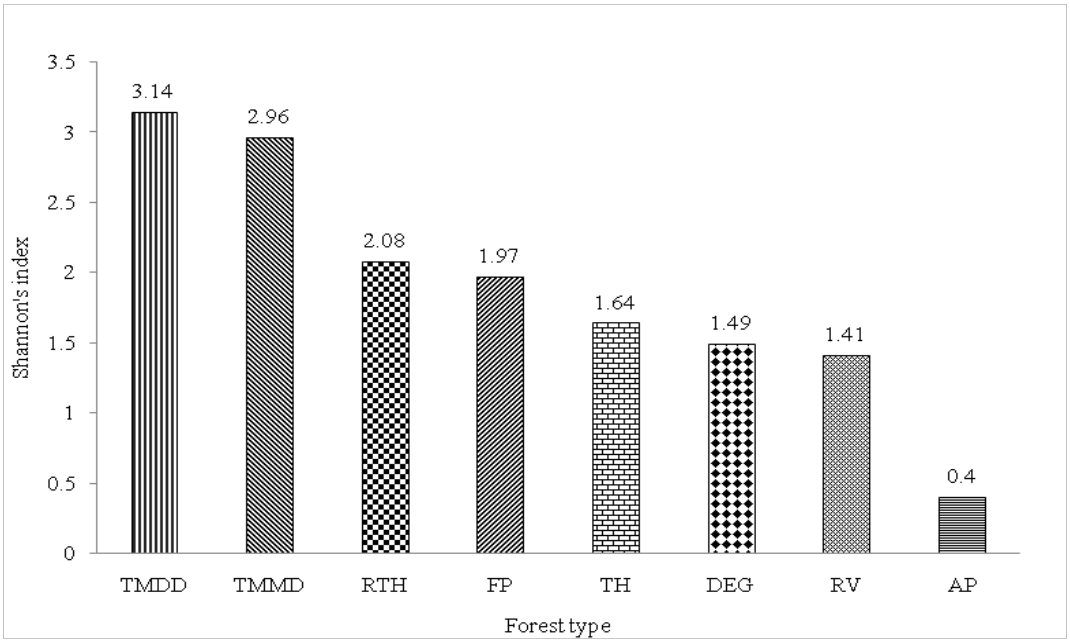

Fig. 3: Shannon's index of plant diversity in different forest types (TMMD-Teak mixed moist deciduous forest, TMDD-Teak mixed dry deciduous forest, TH-Thorn forest, RTH-Ravine Thorn forest, M-Mangrove forest, RV-Riverine forest, AP-*Anogeissus pendula* forest, DEG-Degraded forest, FP-Forest plantation).

Table 3: Ethnobotanically important plants in the forests of Gujarat.

SN.	*Species*	*Family*	*Vernacular name (Gujarati)*	*Habit*	*Forest*	*Medicinal importance*
1.	*Abelmoschus moschatus*	Malvaceae	Musk dana, Kasturi bhinda	Herb	TMDD	Seeds are carminative and used as tonic.
2.	*Acacia catechu*	Fabaceae	Kher	Tree	GR	Plant parts are used as astringent in diarrhea with pyrosis and hypertrophy of tonsils and eruption of skin.
3.	*A. nilotica* subsp. *indica*	-do-	Bavad	-do-	SC	Decoction of bark is used as gargle and pods are used in urino-genital diseases treatment.
4.	*A. planifrons*	-do-	Chhatrobavad	-do-	GR	Seeds are astringent.
5.	*A. senegal*	-do-	Gorad	Shrub	TH	Gum arabic is used for emollient, intestinal troubles and applied externally on inflammation, *viz*., burns, sores and nodules in leprosy. Roots used for dysentery and nodular leprosy. Bark used for diabetes and urinary complaints treatment.
6.	*Achyranthes aspera*	Amaranthaceae	Agehdi, Aghedo.	Herb	SC	Astringent, diuretic, used in menorrhagia and diarrhea. It helps in abortion, decoction of plant is used as a laxative and promotes secretion, used in anasarca, dropsy, piles, boils, eruption of skin. Seeds and leaves used in hydrophobia and snake-bites. Dried plant powder given to children for colic and astringent in gonorrhea.
7.	*Acmella paniculata*	Asteraceae	Marethi	-do-	TMDD	Pungent flowers are chewed for relief in throat infections and paralysis of tongue. Tincture of the capitula acts as a sialagogue and stimulant and used in caries and inflammation of jaw-bones. Herb is used in dysentery.
8.	*Aegle marmelos*	Rutaceae	Bili	Tree	TMDD	Bark used for heart diseases. Fruits are astringent, digestive, laxative and used in diarrhea and dysentery. Leaves cathartic, used in diabetes, fever, mouth ulcers and sun strokes. Roots used for fever, cough, sore throat and diabetes.
9.	*Aerva javanica* var. *bovei*	Amaranthaceae	Bur	Herb	SC	Roots are diuretic. Decoction of stem and roots used for flatulent colic. Flowers expectorant; their infusion used in aphthae and sore throat.
10.	*A. lanata*	Amaranthaceae	Gorakhganjo, Velarogorak	-do-	TMDD	Flowers and leaves are used in asthma, bronchitis and jaundice. Roots are demulcent and diuretic. Whole plant used for cuts, burns, swellings and skin diseases.
11.	*Ageratum conyzoides*	Asteraceae	Ajagandh, Gandhatisedaradi	-do-	TMDD	Used in nervine tonic, juice of the herb is useful in prolepses. Decoction used in diarrhea, dysentery, colic with flatulence and other gastro-intestinal ailments. Extract of flowers is used in asiatic form of Schwartz Leukaemia and prolong the life span of mice. Leaves used for skin diseases and wounds.
12.	*Ailanthus excelsa*	Simaroubaceae	Arduso, rukhdo, Moto arduso	Tree	TMDD	Bark anthelmintic, febrifuge, expectorant and antispasmodic, used for asthma, bronchitis, also used for dysentery, etc. It contains several quasinoids.
13.	*Alangium salviifolium* subsp. *hexapetalum*	Cornaceae	Ankol	-do-	TMDD	Root used for cutaneous troubles; astringent, anti-thelmintic, purgative, emetic, and diaphoretic, also used for biliousness and colic and as a substitute for ipecac (*Cephaelisipecacuanha*). The bark exhibits anti-tubercular activity. Fruit acidic and asrtingent, relished by children. Fruits are laxative, tonic and refrigerant; used in haemorphages. Seeds tonic and refrigerant; also employed in haemorhages.

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14.	*Albizia lebbeck*	Fabaceae	Kaliosaras, Pilosarshio	-do-	TMDD	Leaves and seeds used for eye troubles and bark for bolis.
15.	*A. odoratissima*	Fabaceae	Dholo - sarsad, Kalosarasio	-do-	TMDD	Bark applied externally in leprosy and inverted ulcers. Leaves used as remedy for cough.
16.	*A. procera*	Fabaceae	Safed siris, Kilai	-do-	TMDD	Used for gonorrhoea.
17.	*Alternanthera sessilis*	Asteraceae	Adbautandal, Jalajambi	Herb	TMDD	Accredited with galactagogue properties and used for night blindness, contains carotenes.
18.	*Alysicarpus longifolius*	Fabaceae	Dhodasamervo	-do-	TMDD	Roots used as substitute for liquorice.
19.	*A. monilifer*	Fabaceae	Sameravo	-do-	TMDD	Leaves antipyretic and purgative. Roots used as antidote; also used in cough, leprosy and urinary complaints.
20.	*A. vaginalis*	Fabaceae	Bhoysameravo	-do-	TMDD	Leaves used in cancer and as a purgative. Roots used as a contraceptive. Roots used as expectorant, leprosy and urinary complaint.
21.	*Anogeissus latifolia*	Combretaceae	Dhavdo	Tree	TMDD	Tree yields a gum, used in pharmaceutical preparations. Bark astringent and used in ophthalmia. Root used for urinary complains.
22.	*A. pendula*	Combretaceae	Dhav, Kalodhavado	-do-	TMDD	Seeds used in dysentery. Stem bark in gastritis.
23.	*Asparagus racemosus*	Asparagaceae	Shatavari, Satavari	Herb	TMDD	Root is used as refrigerant, demulcent, diuretic, aphrodisiac, anti-diarrheatic and antidysenteric. Fresh root juice is mixed with honey and used in dyspepsia. Roots are a constituent of medicinal oils used for nervous and rheumatic complaints.
24.	*Avicennia marina*	Acanthaceae	Tivar, Cher	Tree	MF	Aromatic; bitter juice used as an abortifacient.
25.	*Azadirachta indica*	Meliaceae	Limdo, Limba	-do-	TMDD	Bark used in skin troubles. Leaves considered antiseptics, decoction for ulcers and echzema. Flowers tonic and stomachic. Berries purgative, emollient. Seed oil is used for skin affections.
26.	*Balanites aegyptiaca*	Zygophyllaceae	Ingorio, Angario	-do-	TMMD	Unripe fruits cathartic, ripe ones used for whooping cough and skin troubles. Bark anthelmintic. Seeds expectorant, used in whooping cough and for colic; seed extract hypotensive. Fruit pulp used for hair washing.
27.	*Barleria prattensis*	Acanthaceae	Sherio	Shrub	TMDD	Roots used as antidote; and in boils, diarrhea, fever, flatulence and vomiting.
28.	*B. prionitis*	Acanthaceae	Pilokanthasherio	-do-	SC	Juice of the leaves given with honey in catarrhal affection of children. A paste of roots applied to boils and glandular swellings. Leaves chewed to relieve toothache. Roots febrifuge.
29.	*Bauhinia racemosa*	Fabaceae	Ashetro	Tree	FP	Bark astringent used in dysentery. Leaves given with onion for diarrhea and as an anthelmintic. Decotion of leaves used in malaria. Root bark used in intestinal diseases. Leaves also used in skin diseases.
30.	*Biophytum sensitivum*	Oxalidaceae	Risamnu, Zarero, Lajari	Herb	TMDD	Tonic and stimulant, used in chest complaints, convulsions, cramps and inflammatory tumours. Ash is mixed with lime juice and given for stomachache. Leaves and roots styptic. Decoction of leaves given for diabetes, asthama and phthisis. Powdered seeds applied to abscesses to promote suppuration.
31.	*Blainvillea acmella*	Asteraceae	Dholufuladu	-do-	SC	Leaves rheumatic.

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32.	*Blepharis integrifolia*	Acanthaceae	Zinkuutingan	-do-	TMDD	Seeds used in diabetes, ulcers and urinary problems.
33.	*B. maderaspatensis*	Acanthaceae	Untigan, Untanjan, Chokdi	-do-	FP	Seeds used in ulcers and urinary problems.
34.	*Blumea lacera*	Asteraceae	Burando, Kapurio	-do-	TMDD	Juice of the leaves used as an anthelmintic, particularly against threadworms. Herb also used as a febrifuge, diureticand anti-scorbutic.
35.	*Boerhavia plumbaginea*	Nyctaginaceae	Punarnava	-do-	SC	Leaves diuretic and used in jaundice. Roots are used in asthma, bronchitis, inflammation jaundice, rheumatism and swellings.
36	*Bombax ceiba*	Malvaceae	Savar, Sawar, Shimlo, Shemolo	Tree	TMDD	Flowers stem bark and roots are blood purifier and used in cough, diarrhea, dysentery and inflammation. Root bark used for intestinal diseases and sexual disorders.
37.	*Boswellia serrata*	Burseraceae	Salaigugal, Dhupelio, Salai	-do-	TMDD	Bark used against diarrhea and skin troubles. Gum considered expectorant, diuretic and stomachic and used in diarrhea, dysentery, pulmonary infections and cutaneous troubles.
38.	*Bridelia retusa*	Phyllanthaceae	Asan, Monj	-do-	TMDD	Bark and root astringent.
39.	*Butea monosperma*	Fabaceae	Khakhro, Kesudo, Palas	Tree	TH	Bark astringent used for piles, tumours and menstrual disorded. Tree yields a gum called Butea gum which is astringent and used in diarrhea. Flowers decoction or infusion used in diabetes, digestive disorders and urinary complains.
40.	*Canscora diffusa*	Gentianaceae	Zinkukariyatu	Herb	TMDD	Used as tonic and in fever. Fresh juice prescribed in insanity, epilepsy and nervous debility.
41.	*Capparis decidua*	Capparaceae	Ker, Kerdo, Kera	Shrub	SC	Fruits used in biliousness and cardiac troubles. Bark diaphoretic, alexiteric, used in cough and asthma.
42.	*C. grandis*	Capparaceae	Thikaridumro, Dhuti	Tree	TMDD	Infusion of bark and leaves given for swellings and eruptions.
43.	*C. sepiaria*	Capparaceae	Kanthar	-do-	TMDD	Accredited with febrifugal and tonic properties; also found useful for skin troubles.
44.	*C. zeylanica*	Capparaceae	Waghat vel	Shrub	TMDD	Barks sedative and stomachic, used in cholera.
45.	*Cardiospermum halicacabum*	Sapindaceae	Karalio	Herb	SC	Roots diuretic, diaphoretic, emetic, emmenogogue and laxative; used for rheumatism, lumbago and nervous diseases. Leaves rubefacient, used as poultice in rheumatism.
46.	*Careya arborea*	Lecythidaceae	Kumbh, Kumbhi	Tree	TMMD	Bark is anthelmintic, antipyretic, demulcent, used in diarrhea, small pox in snake bite and eruptive fevers. Flowers used as afrodisiac. Fruits and gum are astringent.
47.	*Carissa spinarum*	Apocynaceae	Karvanda, Karamda	Shrub	AP	Root stomachic and anthelmintic. Decoction of leaves given in remittent fevers. Root also used as antidote.
48.	*Caseari aesculenta*	Salicaceae	Kirmira	Tree	TMDD	Roots used in diabetes.
49.	*C. graveolens*	Salicaceae	Kiramira	-do-	TMDD	Root and stem bark used in stomachache.
50.	*C. tomentosa*	Salicaceae	Manjo	-do-	TMDD	Leaves used in swellings. Stem bark and root used in stomachache. Bark powder applied in dropsy.

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51.	*Cassia fistula*	Fabaceae	Garmala, Garmalo	-do-	TMDD	Dried fruits used as a pergative, laxative for habitual constipation. Root used for treatment of black water fever. Leaves and roots used for leprosy, skin diseases, syphilis and throat troubles.
52.	*Cassine albens*	Celastraceae	Bhutalan, Bhutadi	-do-	TMDD	Leaves used headache, hysteria and skin diseases. Roots used as antidote for snake poison and as an emetic.
53.	*Catunaregam spinosa*	Rubiaceae	Mindhod, Midhal	-do-	TMDD	Fruits emetic and used as a substitute of ipecacuanha. Seeds given to induce appetite. Bark astringent, given in diarrhea and dysentery, infusion used as an emetic, also used to be an abortifacient. Bark is a sedative given to relieve pain due to bruises, and bone-ache during fever; also given internally and used externally as an anodyne in rheumatism.
54.	*Celosia argentea*	Amaranthaceae	Kangazaro	Herb	TMDD	Seeds used in diarrhea, eye troubles, and sore mouth. Ash used in lung and chest diseases. Leaves used as antidote, antipyretic, aphrodisiac, gonorrhoea and urinary complains.
55.	*Cenchrus ciliaris*	Poaceae	Jhinudhamnu	-do-	GR	Abortifacient.
56.	*Chamaecrista absus*	Fabaceae	Chimed	-do-	TH	Seeds used in ophthalmia and skin troubles, also as a cathartic. Leaves used in cough.
57.	*C. pumila*	Fabaceae	Nanio chimed	-do-	SC	Seeds used as pergative.
58.	*Cissampelos pareira*	Menispermaceae	Venivel, Karan dhiu	Climber	TMDD	Roots diuretic, antiperiodic, purgative, used in dyspepsia, dropsy and urinary troubles.
59.	*Cleome brachycarpa*	Cleomaceae	Aal	Herb	SC	Used in scabies and rheumatism and for inflammation. Leaves employed in leucoderma.
60.	*C. viscosa*	Cleomaceae	Pili, Talavani	-do-	GR	Leaves used in boils, heartcomplain and skin disease. Seeds anthelmitic; used in inflammation, skin diseases, tumours and ulcers.
61.	*Clerodendrum phlomidis*	Lamiaceae	Arani, Kami	Shrub	TH	Leaves used in boils, eart complain and skin diseases. Seeds anthelmitic; used in inflammation, skin diseases, tumours and ulcers.
62.	*Cocculus hirsutus*	Menispermaceae	Vevdi, Vadhi, Vevati	Climber	RTH	Mucilaginous juice of leaves, mixed with water, used as refrigerant, also applied to eczema, prurigo and impetigo. Roots laxative and demulcent, rheumatism and stomachache in children.
63.	*Colebrookea oppositifolia*	Lamiaceae	Karvat	Shrub	TMMD	Leaves applied to wounds and bruises. Roots used in prescription for epilepsy.
64.	*Commelina benghalensis*	Commelinaceae	Motu shishmuliu	Herb	SC	Leaves used in diarrhea and wounds. Herb considered demulcent, emollient, laxative and refrigerant, used in leprosy.
65.	*C. forskalaei*	Commelinaceae	Shishmuliu	-do-	TMDD	Flowers used in catarrhal and eye complaints.
66.	*Commiphora wightii*	Commelinaceae	Gugur, gugal	Shrub	TMDD	Gum is astringent and antiseptic. Also used as a stomachic and for muscular rheumatism. It stimulates appetite and act as a diaphoretic, diuretic, expectorant, and uterine stimulant.
67.	*Convolvulus prostratus*	Convolvulaceae	Shankhavali	Herb	P	Herb is tonic, blood purifier and purgative. Used in fever, diabetes and hysteria.
68.	*Corchorus aestuans*	Malvaceae	Gitali, Chunch, Chhadhar	-do-	TMDD	Seeds stomachic.

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69.	*C. depressus*	Malvaceae	Jhidki, Bahuphali	-do-	SC	Leaves emollient. Seeds used as tonic.
70.	*C. olitorius*	Malvaceae	Chhunchhdo	-do-	GR	Infusion of leaves tonic and febrifuge; also used as a demulcent in cystitis and dysuria.
71.	*C. tridens*	Malvaceae	Chhunchh	-do-	SC	Herbs used as coolant.
72.	*Cordia dichotoma*	Boraginaceae	Bargund, Gunda, Vadgunda	Tree	TMDD	Fruit astringent, anthelmintic, diuretic, demulcent, and expectorant, used in diseases of chest and urinary passage.
73.	*C. perrottetii*	Boraginaceae	Jangali gundi	Shrub	SC	Fruit astringent, anthelmintic, diuretic, demulcent, and expectorant, used in diseases of chest and urinary passage.
74.	*Crateva adansonii*	Capparaceae	Vayvarno	Tree	TMDD	Bark stimulate liver, its extract used as a laxative, and for promoting appetite; also given urinary affections. Root barks rubefacient. Flowers astringent and cholagogue.
75.	*Crotalaria burhia*	Fabaceae	Kharshan	Herb	GR	Considered refrigerant.
76.	*C. linifolia*	Fabaceae	Adabaushan	-do-	OR	Used in wounds.
77.	*C. medicaginea*	Fabaceae	Adabaumethi	-do-	FP	Seeds used in hypertension.
78.	*Cucumis prophetarum*	Cucurbitaceae	Indramana	-do-	GR	Emetic and purgative and highly toxic.
79.	*Curculigo orchioides*	Hypoxidaceae	Kali musli	-do-	TMDD	Tuberous roots used for skin troubles. Considered demulcent, diuretic and tonic. In combination with aromatic and bitters, they are used in piles, diarrhea, jaundice and asthma.
80.	*Curcuma inodora*	Zingiberaceae	Jangaliharda	-do-	TMDD	Tubers diuretic, galactogogue and purgative.
81.	*Cyanthillium cinereum*	Asteraceae	Sedardi, Sehadadi	-do-	GR	Infusion of the herb makes a useful combination with quinine against malaria. Juice given in incontinence of urine. Roots bitter, used as an anthelmintic, their decoction given in diarrhea and stomach-ache; juice for cough and colic. Flower used in fever, rheumatism and conjunctivitis. Seeds anthelmintic and alexipharmac, effective against threadandround worms.
82.	*Cyclea peltata*	Menispermaceae	Karipat	Climber	SC	Tubers used as a febrifuge. Stomachic and tonic.
83.	*Cymbopogon martini*	Poaceae	Roshado	Herb	TMDD	Used as an aromatic astringent; decoction used as a febrifuge; essential oil applied in rheumatism and neuralgia.
84.	*Cynodon dactylon*	Poaceae	Dharo, Dhrokhad	-do-	FP	Decoction diuretic and used for anasarca. Rhizomes used in genito-urinary troubles.
85.	*Cyperus rotundus*	Cyperaceae	Chido	-do-	OR	Dried tuberous roots diuretic, diaphoretic, and astringent properties, used in stomach and bowel complaints.
86.	*Dactyloctenium aegyptium*	Poaceae	Tardi, Arotaro	-do-	GR	Grains analgesic. Whole plant used in ulcers.
87.	*Dalbergia lanceolaria*	Fabaceae	Tantoshi	Tree	TMDD	Decoction of bark used in dyspepsia; seed oil for rheumatism.
88.	*D. latifolia*	Fabaceae	Sisam	-do-	TMDD	Bark used in eczema, pimples, ulcers. Plant used as stimulant and tonic.
89.	*Dendrocalamus strictus*	Poaceae	Vans	Arboreal	TMDD	Leaves abortifacient and used in urinary complaints. Shoots used in rheumatism.

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90.	*Desmodium gangeticum*	Fabaceae	Shalparni	Herb	TMDD	Roots used as febrifuge, expectorant and diuretic.
91.	*Desmostachya bipinnata*	Poaceae	Darbh	-do-	OR	Culms diuretic, used in dysentery and menorrhagia.
92.	*Dichrostachys cinerea*	Fabaceae	Madhat, Mordhundhiyu	Tree	TMDD	Roots used in rheumatism. Tender shoots are bruised and used in opthalmia.
93.	*Dicoma tomentosa*	Asteraceae	Dholoharancharo	Herb	TMDD	Used as a febrifuge.
94.	*Digera muricata*	Amaranthaceae	Kanjaro	-do-	TMDD	Flowers and seeds used for urinary diseases.
95.	*Dillenia pentagyna*	Dilleniaceae	Karmal	Tree	TMDD	Bark used to treat jaundice.
96.	*Diospyros melanoxylon*	Ebenaceae	Timbru, Timbaroo	-do-	TH	Leaves diuretic, laxative, carminative and styptic; dried flower used in urinary and skin troubles. Decoction of bark used in diarrhea and dyspepsia.
97.	*D. montana*	Ebenaceae	Dheki	-do-	AP	Bark used in stomachache and swellings. Fruits used in boils.
98.	*Dolichandrone falcate*	Bignoniaceae	Matarsingi, Medsingi	-do-	TMDD	Used in diarrhea.
99.	*Drimia indica*	Asparagaceae	Jangalidungadi	Herb	SC	Bulbs are the source of drug known as Indian Squill, used as a cardiatonic, stimulant, expectorant and diuretic; in large doses. However, it is emetic and cathartic and may cause cardiac depression. Bulbs employed as deobstruent, also used in dropsy, rheumatism and skin troubles. Externally used to remove wart and corns.
100.	*Echinochloa colona*	Poaceae	Samo	-do-	GR	Used as a coolant in constipation.
101.	*Eclipta prostrata*	Asteraceae	Bhangra	-do-	MS	Tonic and deobstruent, used in hepatic and spleen enlargements and skin troubles. Roots emetic and pergative; also applied to wounds in cattle.
102.	*Ehretia laevis*	Boraginaceae	Nani vadhvardi, Vadhvardi	Tree	TMDD	Decoction of fresh roots given in venereal diseases.
103.	*Enicostema axillare*	Gentianaceae	Mamejavo	Herb	OR	Bitter tonic, stomachic and laxative, used as a substitute for Chirayita (Swertiachirayita Karst.) as a blood purifier; also used in dropsy and malaria.
104.	*Eragrostis tremula*	Poaceae	Moti bhumasi	-do-	GR	Seeds used in asthma.
105.	*Eranthemum roseum*	Acanthaceae	Dashmuli	-do-	TMDD	Roots boiled in milk and used in leucorrhoea.
106.	*Erythrina suberosa*	Fabaceae	Jakhariokhakhro	Tree	DF	Bark astringent; used in fever. Leaves used as antidote.
107.	*Eucalyptus globulus*	Myrtaceae	Nilgiri	-do-	SC	Essential oil used as anticeptic, expectorant, febrifuge, diaphoretic and diseases of the respiratory tract.
108.	*Euphorbia heterophylla*	Euphorbiaceae	Ubhidudheli	Herb	TH	Leaves used in swellings.
109.	*E. hirta*	Euphorbiaceae	Dudheli	-do-	OR	Used in colic dysentery and diseasess of genito-urinary tract.
110.	*E. neriifolia*	Euphorbiaceae	Thor	Shrub	SC	Latex acrid, rubefacient, purgative, expectorant, used to remove warts and cutaneous erupyion.
111.	*E. nivulia*	Euphorbiaceae	Thor	-do-	TH	Juice purgative and diuretic. Root bark used in dropsy.
112.	*E. prostrata*	Euphorbiaceae	Rati dudheli	Herb	SC	Leaves anthelmintic, astringent, laxative and stimulant. Roots used in amenorrhoea and as an antibiotic. Plant used in diarrhea and ringworm.

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113.	*Evolvulus alsinoides*	Convolvulaceae	Veladi, Kali shankhavali	-do-	SC	Tonic and febrifuge; also used as a vermifuge.
114.	*Fagonia cretica*	Zygophyllaceae	Dhamaso	-do-	GR	Astringent, tonic and febrifuge. Bark used in scabies.
115.	*Ficus amplissima*	Moraceae	Payar	Tree	TMMD	Bark used in abscesses, colic and skin diseases.
116.	*F. benghalensis*	Moraceae	Vad	-do-	TMDD	Latex applied in rheumatism and lumbago. Infusion of bark considered tonic and astringent, used in diarrhea, dysentery and diabetes. Leaves tonic and cooling.
117.	*F. racemosa*	Moraceae	Umbar	-do-	TMDD	Leaves used also in bilious affections. Roots used in diarrhea and diabetes, Fruits considered stomachic and carminative, Used in hemoptysis. Latex used in piles and diarrhea.
118.	*F. religiosa*	Moraceae	Pipalo	-do-	TMDD	Bark astringent and used in skin diseases and ulcers. Fruits coolant and laxative. Leaves purgative and used in skin diseases. Root used in jaundice. Root bark used as aphrodisiac and in lumbago.
119.	*Firmiana colorata*	Malvaceae	Kodaro	-do-	GR	Gum astringent.
120.	*F. simplex*	Malvaceae	Kadayo	-do-	TMDD	Pulverised bark given to women to facilitate delivery. Leaves and tender shoot yield mucilage when steeped in water. It is used for pleuropneumonia in cattle.
121.	*Flacourtia indica*	Salicaceae	Lodri	-do-	TMDD	Bark used in tonsilitis. Fruits astringent.
122.	*Flueggea virosa*	Euphorbiaceae	Shenavi	-do-	TMDD	Leaf juice employed for destroying worms in the sores. Decoction of leaves given as a laxative and antipyretic.
123.	*Gardenia resinifera*	Rubiaceae	Maledi	-do-	TMDD	Yields gum used in cutaneous diseases.
124.	*Garuga pinnata*	Burseraceae	Kakad, Kakadio, Kadkado	-do-	TMDD	Bark used in fractures and internal wounds. Leaves used in asthma.
125.	*Glossocardia bidens*	Asteraceae	Pardeshibhangro	Herb	TH	Roots used for toothache.
126.	*Gmelina arborea*	Lamiaceae	Sevan	Tree	TMDD	Leaves demulcent. Fruits used in fevers and bilious affection.
127.	*Grewia abutilifolia*	Malvaceae	Runchadidhaman	Shrub	TMDD	Fruits used as coolant.
128.	*G. damine*	Malvaceae	Sisoti	Tree	TMDD	Wood used in cough.
129.	*G. tenax*	Malvaceae	Gangeti	Shrub	SC	Fruits used in sun strokes. Root bark tonic and used in injury. Wood used in cough and as an analgesic.
130.	*Gymnosporia emarginata*	Celastraceae	Vico, Vicklo, Vickro, Vigo	Tree	TH	Used as a blood purifier and against inflammations, piles and ulcers. Leaves used in jaundice.
131.	*Haldina cordifolia*	Rubiaceae	Hed kalam	-do-	TMDD	Bark febrifuge.
132.	*Haplanthodes verticillatus*	Acanthaceae	Kaluykariyatu	Herb	TMDD	Used as febrifuge.
133.	*Helicteres isora*	Malvaceae	Marda singi	Shrub	TMDD	Fruits used in intestinal complaints, such as colic, diarrhea, chronic dysentery and flatulence, and to improve appetite. Juice of root is used in diabetes.

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134.	*Hemidesmus indicus*	Apocyanaceae	Upalsari,Sariya, Kapoorimadhuri	Herb	TMDD	The dried roots has long been in use as a demulcent, diaphoretic, diuretic, and alternative, prescribed in rheumatism, gravel other urinary diseases and skin troubles.
135.	*Heterophragma quadriloculare*	Bignoniaceae	Waras	Tree	TMDD	A thick tar extracted from wood is used for cutaneous diseases.
136.	*Hibiscus lobatus*	Malvaceae	Tali	Herb	GR	Roots and seeds used in polyuria.
137.	*Holarrhena pubescens*	Apocyanaceae	Kadoindrajau	Tree	TMDD	Bark astringent, anthelmintic stomachic, antipyretic used in amoebic dysentry.
138.	*Holoptelea integrifolia*	Ulmaceae	Kanaji, Papadi, Odo	-do-	TMDD	Bark blood purifier. Bark and leaves used in colic, diabetes, dyspepsia, flatulence, helminthiasis, inflammations, jaundice, leprosy, rheumatism and skin diseases—seeds used in ringworm.
139.	*Hymenodictyon orixense*	Rubiaceae	Madhmahudo	-do-	DF	Leaves used in skin diseases and sores. Stem bark used in diarrhea, febifuge and fever.
140.	*Hyptis suaveolens*	Lamiaceae	Vilayatitulsi	Herb	TMDD	The plant is pounded and applied to parasitic cutaneous diseases; an infusion is used as a carminative and as a sudorific in catarrhal conditions.
141.	*Indigofera cordifolia*	Fabaceae	Vekar, Bhakho	-do-	GR	Leaves used in abscesses and ulcers. Roots used in skin diseases.
142.	*I. linifolia*	Fabaceae	Nani gali	-do-	SC	Given in febrile erruptions, also considered as vermifuge.
143.	*Ipomoea biflora*	Convolvulaceae	Dhodifudradi	-do-	SC	Roots used in poisonous sting.
144.	*I. coptica*	Convolvulaceae	Zinakifudaradi	-do-	GR	Cold infusion given for dizziness and intoxication. Herb also used for chest complaints in children.
145.	*Jatropha curcas*	Euphorbiaceae	Ratanjyot	Shrub	TH	Seed yield an oil, Curcas oil, a powerful purgative. It is used in sciatica, dropsy and paralysis, and externally for skin troubles and rheumatism; also considered as abortifacient—juice of plant useful in scabies, eczema, and ringworm; leaves rubefacient and lactagogue.
146.	*Justicia japonica*	Acanthaceae	Khadselio	Herb	SC	Used as diuretic, diaphoretic, expectorant, febrifuge and laxative.
147.	*J. procumbens*	Acanthaceae	Khadselio	-do-	SC	Laxative, diaphoretic, diuretic, expectorant, anthelmintic, and febrifuge. Infusion of herb used in asthma, cough, rheumatism, lumbago and flatulence.
148.	*Kydia calycina*	Malvaceaae	Moti hirvani	Tree	SC	It helps in salivation. Leaves are made pounded and made a paste and applied to the body for pains.
149.	*Lagerstroemia parviflora*	Lythraceae	Bondar	-do-	TMDD	Decoction of dried fruits as well as of leaves used in diabetes. Leaves purgative, diuretic and deobstruent.
150.	*Laggera alata*	Asteraceae	Bodiyokalhar	Herb	SC	Plant used as a disinfectant.
151.	*Lannea coromandelica*	Anacardiaceae	Modal	Tree	TMDD	Bark is acrid, astringent; it is used as a lotion for bruises, wounds, sores, ulcers and sore eyes.
152.	*Lantana aculeata*	Verbenaceae	Abhangani, Gandhati	Shrub	TMDD	Plant credited with vulnerary, diaphoretic, carminative and anti-spasmodic properties, used in fistulae, pustules, and tumours; decoction given in tetanus, rheumatism and malaria.
153.	*Laphangium luteoalbum*	Asteraceae	Munderi	Herb	TMDD	Leaves astringent and vulnerary.

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154.	*Lavandula bipinnata*	Lamiaceae	Asmanigalgot	-do-	GR	Roots used in poisonous sting.
155.	*Lepidagathis cuspidata*	Acanthaceae	Kantaloharancharo	-do-	SC	Plant used as tonic in fevers. Also applied to itchy affection of the skin.
156.	*L. trinervis*	Acanthaceae	Haran charo	-do-	TMDD	Considered as a bitter tonic.
157.	*Leptadenia reticulata*	Apocyanaceae	Khirdodi, Nani dodi	-do-	GR	Stimulant and restorative. Leaves and roots used in skin affection.
158.	*Leucaena leucocephala*	Fabaceae	Rambaval	Tree	FP	Bark analgesic.
159.	*Leucas aspera*	Lamiaceae	Doshi - no - kubo	Herb	SC	Juice of the leaves applied externally in psoriasis, chronic skin eruptions, and painful swellings—flowers given with honey for coughs and colds. Herb is used as an antipyretic.
160.	*L. longifolia*	Lamiaceae	Lamba pan no kubo	-do-	TH	Used in boils, cough, ear pains, fever, headache, and antidote.
161.	*Lotus garcinia*	Fabaceae	Moto bhakho	-do-	SC	Used in abscesses.
162.	*Madhuca longifolia* var. *latifolia*	Sapotaceae	Mahudo	Tree	TMDD	Used in rheumatism and skin affections, and as a laxative in cases of habitual constipation and piles. Flowers considered demulcent and tonic.
163.	*Malachra capitata*	Malvaceae	Pardeshi bhindi	Herb	TH	Plant emmolient and pectoral. Root used in embrocations for rheumatism and lumbago, and as a febrifuge. Leaves anthelmintic.
164.	*Mallotus philippensis*	Euphorbiaceae	Kapilo	Tree	TMMD	Anthelmintic, Leaves, fruit and bark are applied externally in skin infections; used in anorexia, fever, giddiness, hemiplagia, hepatic and thoracic pain.
165.	*M. polycarpus*	Euphorbiaceae	Goli	-do-	TMDD	Poultice of roots applied in gout and rheumatism.
166.	*Mangifera indica*	Anacardiaceae	Ambo	-do-	TMMD	Fruit laxative, diuretic. Bark used for uterine hemorrhage and seeds in asthma.
167.	*Manilkara hexandra*	Sapotaceae	Rayan	-do-	TMDD	Bark febrifuge.
168.	*Melia azedarach*	Meliaceae	Nimbara	-do-	P	Fruit anthelmintic; enters into prescriptions for skin troubles.
169.	*Meyna laxiflora*	Rubiaceae	Alev, Adev	-do-	TMDD	Dry fruits narcotic, used for dysentery and boils. Powdered leaves used in diphtheria.
170.	*Miliusa tomentosa*	Annonaceae	Umbh	-do-	TH	Leaves and bark used in skin diseases. Bark febrifuge.
171.	*Mimosa hamata*	Fabaceae	Kaibaval	Shrub	TMDD	Flowers used in lung and chest diseases. Leaves in dental problems. Root and stem used in asthma and cough.
172.	*Mitragyna parvifolia*	Rubiaceae	Kadamb	Tree	SC	Bark and roots used in colic and as febrifuge.
173.	*Morinda pubescens*	Rubiaceae	Aal, Aali, Aaledi	-do-	SC	Leaves used in skin diseases and injuries.
174.	*Moringa concanensis*	Moringaceae	Jangalisaragavo, Kadvosaragavo, Dungrausaragavo	-do-	TMDD	All parts of the tree used in ascites, venomous bites, rheumatism and as cardiac and circulatory stimulant. Root rubefacient and vesicant. Leaves rich in vitamin A and C, useful in scurvyand catarrhal affections, also used as emetic. Flower tonic, diuretic, and cholagogue; seeds antipyretic.
175.	*Neuracanthus sphaerostachyus*	Acanthaceae	Ganthera	Herb	TH	Paste prepared from roots used for ring worm; also used in indigestion.
176.	*Nyctanthes arbor-tristis*	Oleaceae	Parijat	Tree	TMDD	Leaves antibilious and expectorant, used in rheumatism and fevers; decoction given in sciatica, juice used as cholagogue, laxative, diaphoretic, diuretic and anthelmintic. Bark expectorant contains two alkalloid, of these the water soluble one stimulates the ciliary movement of the oesophagus—powdered seeds used for scurfy affection of the scalp.

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177.	*Ocimum americanum*	Lamiaceae	Ran tulsi	Herb	DF	Seeds diuretic and tonic, used in the preparation of a cooling drink.
178.	*Oldenlandia corymbosa*	Rubiaceae	Parpat	-do-	TMDD	It is considered stomachic, pectoral, and refrigerant. Decoction prescribed in remittent fever with gastric irritability and nervous depression caused by deranged bile; also used in jaundice and other liver troubles.
179.	*Oroxylum indicum*	Bignoniaceae	Tetu	Tree	TMDD	Root tonic and astringent, used in diarrhea and dysentery, also diaphoretic and used in rheumatism. Boiled in oil, it is used in otorrhoea. Tender fruits refreshing and stomachic; seeds purgative. Decoction of leaves given in stomachache and rheumatism; leaves used externally for enlarged spleen.
180.	*Parthenium hysterophorus*	Asteraceae	Congress ghas	Herb	OR	Plant used as tonic, febrifuge, emmenagogue and analgesic, decoction of roots given in dysentery.
181.	*Paspalum distichum*	Poaceae	Kodari	-do-	TMDD	Used in eye diseases and rheumatism.
182.	*Pavonia arabica*	Malvaceae	Adadiyo	-do-	SC	Roots and leaves used as purgative and vermifuge, also used in inflammations.
183.	*Pennisetum glaucum*	Poaceae	Kunchi, Ziptighas	-do-	TMDD	Plant used as an antidote.
184.	*Phoenix dactylifera*	Arecaceae	Khajuri, Khareknujad	Tree	FP	Fruits demulcent, expectorant, and laxative, also used in respiratory diseases and fever.
185.	*Phyllanthus emblica*	Phyllanthaceae	Amla	-do-	TMDD	Fruit sour and astringent, cooling, diuretic, laxative; eaten raw or cooked, also prickled; a rich source of vitamin C; contains twenty times as much vitamin C as orange juice.
186.	*P. fraternus*	Phyllanthaceae	Bhoyambali	Herb	OR	Astringent, deobstruent, stomachic, diuretic and febrifuge, used for stomach troubles such as diarrhea, dysentery, dyspepsia and colic; and also used in dropsy and diseases of urino-genital system. Fresh root given in jaundice, also used as a galactogogue. Latex applied to sores.
187.	*Physalis minima*	Solanaceae	Popati	-do-	TMDD	Tonic, diuretic and purgative.
188.	*Pimpinella heyneana*	Apiaceae	Jangalijiru	-do-	TMDD	Root febrifuge.
189.	*Plectranthus mollis*	Lamiaceae	Fangroot	-do-	TMMD	Crushed leaves used to prevent bleeding and as a febrifuge, also used as a mosquito repellent. Leave and flower top yield an essential oil which acts as a cardiac depressant, respiratory stimulant, and vasoconstrictor; also exhibits relaxant activity on smooth and skeletal muscles.
190.	*Pluchea lanceolata*	Asteraceae	Nani rashna	-do-	SC	Plant used in rheumatoid arthritis.
191.	*Podospermum laciniatum* subsp. *decumbens*	Asteraceae	Bhopatri	-do-	OR	Used as galactogogue.
192.	*Pogostemon pubescens*	Lamiaceae	Jangalipatcholi	-do-	TMMD	Leaves used as a stimulant and styptic; their juice used in colic and as a febrifuge. Root stimulant and anti-haemorrhagic.
193.	*Polycarpaea corymbosa*	Caryophyllaceae	Zina pan no okhrad	-do-	TMDD	Leaves used in jaundice, also applied in the form off poultice to boils and inflammatory swellings.
194.	*Polygala erioptera*	Polygalaceae	Bhoysan	-do-	GR	Leaves used in inflammation. Roots in fever.

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195.	*Pongamia pinnata*	Fabaceae	Karanj	Tree	RV	Pongam oil is applied in scabies, herpes, leucoderma and other cutaneous diseases; internally, it is used in dyspepsia with sluggish liver. Leaves act as a galactagogue. Juice of leaves prescribed in flatulence, dyspepsia, diarrhea and cough; also used in leprosy and gonorrhea. Juice of roots used for clean foul ulcers and fistulous sores and for cleaning teeth. Fresh bark given in piles. Decoction of bark given in beri-beri.
196.	*Premna herbacea*	Lamiaceae	Geeteli	Herb	GR	Root used in toothache. Leaves in boils, cough, fever, and rheumatism and along with ginger in asthma rheumatism and dropsy.
197.	*Prosopis cineraria*	Fabaceae	Khijado, Samadi	Tree	TMDD	Pods astringent, demulcent and pectoral.
198.	*P. juliflora*	Fabaceae	Gandobaval	-do-	SC	Leaves used in wounds.
199.	*Pterocarpus marsupium*	Fabaceae	Biyo	-do-	TMDD	Yields a kino gum, used in diarrhea and dysentery. Aqueous infusion of wood used in diabetes and water stored in vessels made from this wood is reputed for its anti-diabetic properties.
200.	*Pulicaria crispa*	Asteraceae	Son fuladi	Herb	TMDD	Dried herb used as a vulnerary for bruises and sores of bullocks. Decoction febrifuge.
201.	*P. wightiana*	Asteraceae	Son fuladi	-do-	TH	Astringent. Used in cuts and wounds.
202.	*Pupalia lappacea*	Amaranthaceae	Gadarzipato	-do-	SC	Fruit mixed with palm oil applied to boils. Given in the form of soup for cough and fever. Ashes after burning the plant are mixed in water and given for flatulence, also applied to leprosy sores.
203.	*Putranjiva roxburghii*	Putranjivaceae	Putranjiva	Tree	RV	Leaves and stones given in decoction for cold, fever and rhematism.
204.	*Rhus mysurensis*	Anacardiaceae	Kasedi, Dasan, Dasni	-do-	TMDD	Leaves used in swelling and as a vesicant.
205.	*Rhynchosia minima*	Fabaceae	Nanikhatvel	Herb	TH	Leaves used as an abortifacient.
206.	*Ruellia patula*	Acanthaceae	Fatakadi	-do-	TMDD	Fruits used in diabetes. Roots used in boils, rheumatism and swellings.
207.	*Rungia pectinata*	Acanthaceae	Khadsaliyo	-do-	TMDD	Juice of leaves refrigerant and aperient. Bruised leaves applied to constusions. Root febrifuge.
208.	*R. repens*	Acanthaceae	Moto khadsalio	-do-	TMDD	Herb dried and pulverized for use in case of cough and fever; also vermifuge and diuretic. Fresh brushed leaves are mixed with castor oil and applied to scalp as a cure for tinea capitis, a scaly fungoid infection.
209.	*Salvadora oleoides*	Salvadoraceae	Mithi jar	Shrub	SC	Leaves given to horses as a purgative; also used for relief in cough. Fruits used for enlarged spleen and low fever and rheumatism. Root bark used as a vesicant.
210.	*S. persica*	Salvadoraceae	Khari jar, Piludi	-do-	SC	Fresh root bark used as a vesicant and employed as an ingredient of snuff; decoction used as tonic and emmenagogue. Stem bark used for gastric troubles and as an as carifuge. A decoction of leaves used in asthma and cough, their poultice used for piles and tumor. Fruits deobstruent, carminative, lithontriptic, diuretic and stomachic; used in biliousness and rheumatism. Seeds purgative, diuretic and tonic.
211.	*Sapindus trifoliatus*	Sapindaceae	Aritha	Tree	TMDD	Fruits emetic, tonic, asrtingent and anthelmintic; used in asthma, colic due to indigestion, diarrhea, cholera, tubercular glands, paralysis of limbs and lumbago. Root and bark expectorant and demulcent.

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212.	*Schleichera oleosa*	Sapindaceae	Kusumbi,Kosim	-do-	TMDD	Bark used in applications for itch, pain in the back and loins, inflammations and ulcers. Oil from seeds used as a cure for skin troubles and for message in rehumatism.
213.	*Schrebera swietenioides*	Oleaceae	Markho, Mokh	-do-	TMDD	Leaves used in enlargement of the spleen and in urinary discharges. Roots used in leprosy; bark for boils and burns. Fruit used for hydrocoele.
214.	*Senna auriculata*	Fabaceae	Awal, Avali, Aval	Shrub	TMDD	Bark astringent. Leaves and fruits anthelmintic. Seed used in eye troubles, diabetes, and chylous urine. Root employed in skin troubles.
215.	*S. occidentalis*	Fabaceae	Kasundri	Herb	TH	Leaves and seeds pergative, seeds also used in external applications for skin troubles. Leaves used in skin diseases.
216.	*S. sophera*	Fabaceae	Sundri	Shrub	TMDD	Leaves used in skin diseases. Roots diuretic.
217.	*S. tora*	Fabaceae	Dadhajozad, Kovariya	Herb	TMDD	Leaves purgative; used in ringworm and other skin troubles and jaundice. Seeds used in eczema, gonorrhea, lung and chest diseases, ring worm and skin diseases.
218.	*Sida acuta*	Malvaceae	Kantalobala	-do-	TMDD	Strong decoction of the root has a diaphoretic, antipyretic, stomachic, tonic and has been found very useful in febrile affection and dyspepsia; root juice acts as an electuary and used in intestinal worms; root is used as tonic, astringent, cooling, digestive, diuretic, burning of the body and urinary discharges; leaves made worm and moistened with a little gingelly oil which has aphrodisiac, diuretic properties and used as demulcent in gonorrhea.
219.	*S. cordifolia*	Malvaceae	Bala	-do-	TMDD	Leaves demulcent and febrifuge; also used in dysentery. Root astringent, diuretic and tonic; infusion given in urinary troubles, cystitis, strangury and hematuria. Powdered roots given with milk in leucorrhoea and frequent micturition.
220.	*S. glabra*	Malvaceae	Chikanibala	-do-	TMDD	Seeds are mixed with jaggery and given in lumbago.
221.	*S. rhombifolia*	Malvaceae	Mahabala	-do-	TMDD	The roots and leaves are used in aphrodisiac, tonic, good in urinary complaints; useful in fever, heart diseases, burning sensations, piles; root is useful in rheumatism and tuberculosis. Stem abounds in mucilage and used as a demulcent and emollient.
222.	*Solanum americanum*	Solanaceae	Piludi	Herb	FP	Freshly prepared extracted herb is effective in cirrhosis of the liver. Berries are tonic, alterative, and diuretic & are useful in heart disease. Also used externally in disorders of eyesight & hydrophobia. Juice is given in chronic enlargements of the liver. It acts as a hydragogue, cathartic, and diuretic.
223.	*Soymidafebrifuga*	Meliaceae	Rohan, Royan	Tree	TMDD	Bark used in the treatment of diarrhea, dysentery, and fevers, and also as a general tonic; decoction used for gargles, vaginal infections, rheumatic swellings and enemata.
224.	*Spermacoce pusilla*	Rubiaceae	Ganthiyu, Bakareto	Herb	TMDD	Extract of leaves given for hemorrhoids and gall-stones. Seeds demulcent, used in diarrhea and dysentery.
225.	*Sterculia guttata*	Sterculiaceae	Davlo	Tree	TMDD	Leaves in fractures, throat affection and wounds.

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226.	*Strebelus asper*	Moraceae	Harero	-do-	RV	Infusion of leaves taken as a substitute for tea; their poultice applied to swellings. A poultice of roots applied to ulcers, sinuses, swellings, and boils. Pulverized roots are given in dysentery. A decoction of bark used in fevers, diarrhea, and dysentery. Latex astringent and antiseptic and applied to sore heals, chapped hands and glandular swellings; also applied to the temples as a sedative in neuralgia. Seeds used in epistaxis, piles, and diarrhea; externally, their paste applied in leucoderma—leaves used as a galactagogue.
227.	*Suaeda vermiculata*	Amaranthaceae	Ubhiluni	Herb	P	Aqueous infusion used as an emetic.
228.	*Synedrella nudiflora*	Asteraceae	Luni	-do-	TMDD	Leaves enter into embrocations used in rheumatism and laxative also.
229.	*Syzygium cumini*	Myrtaceae	Jambu	Tree	TMMD	Decoctions of bark and that of powdered seeds are used in diabetes.
230.	*S. salicifolium*	Myrtaceae	Jal jambu	-do-	RV	Bark in diabetes.
231.	*Tamarindus indica*	Fabaceae	Ambali	-do-	TH	Fruit pulp is refrigerant, carminative, and laxative, given as an infusion in biliousness and febrile condition.
232.	*Tamilnadia uliginosa*	Rubiaceae	Gangeda	-do-	TMDD	Unripe fruit astringent, used in diarrhea and dysentery especially during pregnancy. Roots employed in biliousness, diarrhea, and dysentery.
233.	*Tectona grandis*	Lamiaceae	Sag	-do-	TMDD	Oily product obtained by distillation of wood chips applied to eczema. Kernels yield fatty oil, which is used in scabies and to promote the growth of hair. Flowers used in biliousness, bronchitis, and urinary discharges. Both flowers and seeds considered diuretic. Bark astringent, used in bronchitis.
234.	*Tephrosia purpurea*	Fabaceae	Sharpankho	Herb	P	Tonic, laxative, diuretic and deobstruent; used in bronchitis and bilious febrile attacks; and also for boils, pimples and bleeding piles. Root and seeds insectisidal and piscicidal. A decoction of roots given in dyspepsia, diarrhea, rheumatism, asthma, and urinary disorders; roots given with black pepper in colic. A liniment prepared from the roots is used in elephantiasis. Pulverized roots smoked for relief from asthma and cough—a decoction of pods used as a vermifuge and to stop vomiting. Seeds yield an oil said to be specific against scabies, itch, eczema and other skin eruptions.
235.	*Terminalia bellirica*	Combretaceae	Baheda	Tree	DF	Ripe fruits used as an astringent in combination with chebulic myrobalan; half ripe fruits used as purgative due to presence of an oil having properties similar to those of castor oil. The oil is applied to rheumatic swelling. Mixed with honey, fruit- pulp employed in ophthalmia. Bark diuretic and gum yielded by the tree demulcent and purgative.
236.	*Thespesia lampas*	Malvaceae	Nano paras piplo, Jangalibhindo	-do-	TMDD	Roots and fruits employed in gonorrhea and syphilis. Floral parts used for cutaneous diseases.
237.	*Toona ciliata*	Meliaceae	Toon	-do-	TMDD	The bark is astringent and is a mild febrifuge; useful in diarrhea and dysentery; flowers are emmenagogue.
238.	*Tribulus terrestris*	Zygophyllaceae	Bethugokhru, Mithogokhru	Herb	TMDD	Fruits tonic and diuretic, used in painful micro-nutrition and calculous affection; also prescribed in Bright's diseases. Leaves stomachic, used as lithontriptic. Roots apperient.
239.	*Trichodesma indicum*	Boraginaceae	Undhafuli	-do-	GR	Herb emolient and diuretic, prescribed for expulsion of dead foetus. Infusion of leaves depurative. Roots used in dysentery; pounded and applied to swellings of joints—flower sudorific and pectoral.

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240.	*Tridax procumbens*	Asteraceae	Pardesibhangaro	-do-	TMDD	Leaves used in bronchial catarrh, dysentery, and diarrhea. Leaf juice insecticidal and piscicidal, also used to check hemorrhage of wounds.
241.	*Triumfetta rhomboidei*	Malvaceae	Jhipato	-do-	SC	Bark and leaves used for diarrhea and roots for dysentery. Pounded leaves given for intestinal ulcers, and their hot infusion hastens parturition. Leaves and flowers used in leprosy.
242.	*Urena lobata*	Malvaceae	Vagdaubhind	-do-	TMDD	Roots diuretic. The decoction of stem and roots used for flatulent colic. Flower expectorant; their infusion used in aphthae and sore throat.
243.	*Vigna radiata*	Fabaceae	Jangali moong	-do-	SC	Decoction of seeds given in beri-beri as a diuretic. Seeds also used for ventigo, fever astringent.
244.	*Viguieranthus alternans*	Fabaceae	Gorasambli	Tree	FP	Leaves used in swellings. Pods coolant.
245.	*Viola cinerea*	Violaceae	Zinkobanfas	Herb	SC	Roots emetic, used as a substitute and adulterant of ipecac, flowers demulcent, emollient. Whole plant used in asthma, bronchitis, and febrifuge.
246.	*Woodfordia fruticosa*	Lythraceae	Dhawadi	Shrub	TMDD	The commercially available drug consists of dried fruits, flowers, buds and broken pieces of inflorescence and much used in bowel complaints, urinary complaints hemorrhages, menorrhagia and seminal weakness.
247.	*Wrightia arborea*	Apocyanaceae	Runchalodudhlo	Tree	TMDD	Dried bark is used as an adulterant, antidote, fever and menorrhagia.
248.	*W. tinctoria*	Apocyanaceae	Dudhkadi	-do-	TMDD	Bark and seeds in flatulence and bilious troubles. Seeds aphrodisiac and anthelmintic. Stem bark antidote for fever and menorrhagia.
249.	*Xanthium strumarium*	Asteraceae	Gadariyun	Herb	TMDD	Herb diaphoretic, diuretic, emollient, and sedative. Decoction used in chronic malaria, leucorrhoea, and urinary diseases. Fruits cooling and demulcent. Buds tonic, diuretic and sedative. Seeds used for resolving inflammatory swellings and their oil for bladder affections, herpes, and erysipelas. Leaves are astringent, diuretic and antisyphilitic, used in scrofula and herpes. Roots bitter and tonic, used against cancer and scrofula; extract applied to ulcers, boils, and abscesses.
250.	*Ziziphus mauritiana*	Rhamnaceae	Bor, Bordi	Tree	TMDD	Fruits of wild trees considered cooling, anodyne and tonic. Kernels sedative, used as asoporific, and to stop vomiting and in insomnia also employed as an antidote to aconite-poisoning and for abdominal pain in pregnancy. Seeds are given in diarrhea. Leaves astringent and diaphoretic.
251.	*Z. rugosa*	Rhamnaceae	Ghotbor/ghatbor	Shrub	TMMD	Bark given in diarrhea.
252.	*Zornia gibbosa*	Fabaceae	Sonvel	Herb	GR	Herb used for dysentery. Root given to children as a soporific.

Forest types: TMMD-Teak mixed moist deciduous forest, TMDD-Teak mixed dry deciduous forest, TH-Thorn forest, RTH-Ravine Thorn forest, M-Mangrove forest, MS-Mangrove scrub, RV-Riverine forest, AP-*Anogeissuspendula*forest, FP-Forest plantation, DEG-Degraded forest, P-*Prosopis julflora*scrub, SC-Scrub, OR-Orchard, GR-Grassland.

Forests in Gujarat are facing various threats like forest fires, cattle grazing, fodder extraction, illegal charcoal production in some areas, and over-exploitation of ethnobotanically important plant species. An effective, long-term forest (and biodiversity) conservation strategy, therefore, needs to be planned and implemented for better ecosystem goods and services. Preventing cattle grazing (by promoting stall feeding) and forest fires could substantially improve the health of the forest ecosystems. Assisted natural regeneration using local species in place of mono-species plantations could considerably contribute to faster recovery of the forests.

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